## What is claimed is:

l	1.	A method comprising:
2		determining a slack value for each of one or more ready instructions based on resource
3		constraints;
1		selecting one of the ready instructions, based on the slack value; and
5		scheduling the selected ready instruction.
l		
l	2.	The method of claim 1, further comprising:
2		performing the method set forth in claim 1 until all instructions in a scheduling region
3		have been scheduled.
l		
I	3.	The method of claim 1, wherein:
2		determining a slack value for each of the one or more ready instructions further
3		comprises determining the slack value for the instruction based on resource
1		constraints and dependence height.
5		
ł	4.	The method of claim 1, wherein determining a slack value further comprises:
2		determining a dependence deadline based on a dependence height for the instruction;
3		determining a resource deadline based on resource constraints for the instruction;

4		selecting between the resource deadline and the dependence deadline to choose a
5	dea	adline value that indicates a least number of cycles; and
6		determining the slack value based on the selected deadline value.
1		
1	5.	The method of claim 1, wherein:
2		selecting one of the ready instructions further comprises selecting a ready instruction
3		having a lowest slack value.
1		
1	6.	The method of claim 1, further comprising:
2		generating an entry in a ready list for each of the one or more ready instructions; and
3		removing the entry for the selected ready instruction from the ready list.
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1	7.	The method of claim 6, further comprising:
2		adding to an uncover list any instructions uncovered by the scheduling of the selected
3		ready instruction.
1		
1	8.	The method of claim 6, further comprising:
2		advancing a virtual clock to a subsequent clock cycle; and
3		adding an entry to the ready for list for any instruction that becomes ready in the
4		subsequent clock cycle.

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1	9. The method of claim 1, further comprising:
2	determining a minimum number of cycles needed to schedule the instructions of a
3	scheduling region, taking resource constraints into account.
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1	10. The method of claim 9, wherein:
2	the minimum number of cycles is determined to be a dependence length of the scheduling
3	region if the scheduling region is dependence-bound; and
4	the minimum number of cycles is determined to be a resource length of the scheduling
5	region if the scheduling region is resource-bound.
1	
1	11. The method of claim 10, further comprising:
2	calculating the dependence length of the scheduling region based on the total height of a
3	dependence graph of the scheduling region; and
4	calculating the resource length of the scheduling region based on the maximum number
5	of cycles needed to schedule the instructions of the scheduling region for a machine resource.
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1	12. The method of claim 1, wherein:
2	the resource constraints include the maximum number of instructions of a particular
3	instruction type that can be scheduled during a given cycle for a selected target processor.

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1	13. An article comprising:
2	a storage medium having a plurality of machine accessible instructions, which if executed
3	by a machine, cause the machine to perform the following operations:
4	determining a slack value for each of one or more ready instructions based on resource
5	constraints;
6	selecting one of the ready instructions, based on the slack value; and
7	scheduling the selected ready instruction.
1	
1	14. The article of claim 13, wherein:
2	the plurality of machine accessible instructions further include instructions, which if
3	executed by a machine, cause the machine to perform the method set forth in claim 1
4	until all instructions in a scheduling region have been scheduled.
1	
1	15. The article of claim 13, wherein the instructions, which if executed by a machine,
2	cause the machine to perform determining a slack value further comprise
3	instructions, which if executed by a machine, cause the machine to perform:
1	determining the slack value for the instruction based on resource constraints and
5	dependence height.

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1	· 16. T	he article of claim 15, wherein the instructions, which if executed by a machine
2	С	ause the machine to perform determining a slack value further comprise
3	iı	structions, which if executed by a machine, cause the machine to perform:
4	determin	ing a dependence deadline based on a dependence height for the instruction;
5	determin	ing a resource deadline based on resource constraints for the instruction;
6	selecting	between the resource deadline and the dependence deadline to choose a
7	deadline val	ne that indicates a least number of cycles; and
8	determin	ing the slack value based on the selected deadline value.
1		
1	17. T	he article of claim 13, wherein:
2	instruction	ons that cause the machine to perform selecting one of the ready instructions
3	furth	er comprise instructions, which if executed by a machine, cause the machine to
4	perfo	rm selecting a ready instruction having a highest scheduling priority.
1		
1	18. T	he article of claim 13, wherein the plurality of instructions further comprise
2	ir	structions, which if executed by a machine, cause the machine to perform:
3	generatir	g an entry in a ready list for each of the one or more ready instructions; and
4	removing	the entry for the selected ready instruction from the ready list.

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1	٠ 19.	The article of claim 18, wherein the plurality of instructions further comprise
2		instructions, which if executed by a machine, cause the machine to perform:
3	ado	ling to an uncover list any instructions uncovered by the scheduling of the selected
4		ready instruction.
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1	20.	The article of claim 18, wherein the plurality of instructions further comprise
2		instructions, which if executed by a machine, cause the machine to perform:
3	adv	vancing a virtual clock to a subsequent clock cycle; and
4	ado	ling an entry to the ready for list for any instruction that becomes ready in the
5		subsequent clock cycle.
1		
1	21.	The article of claim 13, wherein the plurality of instructions further comprise
2		instructions, which if executed by a machine, cause the machine to perform:
3	det	ermining a minimum number of cycles needed to schedule the instructions of a
4		scheduling region, taking resource constraints into account.
1		
1	22.	The article of claim 21, wherein the plurality of instructions further comprise
2		instructions, which if executed by a machine, cause the machine to perform:
3	det	ermining the minimum number of cycles to be a dependence length of the scheduling
4	region	if the scheduling region is dependence-bound; and

5	determining the minimum number of cycles to be a resource length of the scheduling	
6	region if the scheduling region is resource-bound.	
1		
1	23. The article of claim 22, wherein the plurality of instructions further comprise	ise
2	instructions, which if executed by a machine, cause the machine to perform	1:
3	calculating the dependence length of the scheduling region based on the total heigh	ht of a
4	dependence graph of the scheduling region; and	
5	calculating the resource length of the scheduling region based on the maximum nu	mber
6	of cycles needed to schedule the instructions of the scheduling region for a machine re	source.
1		
1	24. The article of claim 13, wherein:	
2	the resource constraints include the maximum number of instructions of a particular	ar
3	instruction type that can be scheduled during a given cycle for a selected target	į.
4	processor.	
1		
1	25. A compiler comprising:	
2	a front end; and	
3	a code generator;	
4	wherein the code generator includes one or more resource-aware schedulers to sch	edule
5	instructions, the one or more resource-aware schedulers to take resource constr	aints
6	into account to generate a slack value for each of the instructions.	

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1	26.	The compiler of claim 25, wherein:
2	sa	id one or more resource-aware schedulers is further to determine a first scheduling
3		deadline for an instruction in a scheduling region, taking dependence considerations
4		into account; and
5	sa	id one or more resource-aware schedulers is further to determine a second scheduling
6		deadline for the instruction, taking resource constraints into account; and
7	sa	id one or more resource-aware schedulers is further to select between the first and
8		second scheduling deadlines to choose a scheduling priority for the instruction.
1		
1	27.	The compiler of claim 25, wherein:
2	sa	id resource-aware scheduler is further to select among ready instructions to select an
3		instruction for scheduling.
1		
1	28.	The compiler of claim 26, wherein:
2	sa	id resource-aware scheduler is further to select the instruction for scheduling based or
3		its scheduling priority.
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1	20	The compiler of claim 25, wherein:

2	said resource constraints include a maximum number of instructions that can be
3	scheduled per cycle.
1	
1	30. The compiler of claim 25, wherein:
2	said resource constraints include the maximum number of instructions of a particular
3	instruction type that can be scheduled per cycle.
1	
1	31. The compiler of claim 25, wherein:
2	the resource-aware scheduler is further to schedule the instructions such that instructions
3	of a particular instruction type are distributed evenly among two or more resources.
1	
1	32. A system comprising:
2	a processor; and
3	a memory system to store instructions;
4	wherein the instructions include a resource-aware scheduler to determine, based on
5	resource constraints, a slack-based scheduling priority for each of one or more instructions.
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1	33. The system of claim 32, wherein:
2	the memory system includes a DRAM.
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1	The system of claim 32, wherein:
2	said resource-aware scheduler is further to determine a first scheduling deadline for an
3	instruction in a scheduling region, taking dependence considerations into account;
4	and
5	said resource-aware scheduler is further to determine a second scheduling deadline for
6	the instruction, taking resource constraints into account; and
7	said resource-aware scheduler is further to select between the first and second scheduling
8	deadlines to determine the scheduling priority for the instruction.
1	
1	35. The system of claim 32, wherein:
2	said resource-aware scheduler is further to select among ready instructions to select an
3	instruction for scheduling.
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1	36. The system of claim 35, wherein:
2	said resource-aware scheduler is further to select the instruction for scheduling based on
3	its scheduling priority.
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1	37. The system of claim 32, wherein:
2	said resource constraints include a maximum number of instructions that can be
3	scheduled per cycle.

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- ٠ 38. The system of claim 32, wherein: 1
- said resource constraints include the maximum number of instructions of a particular 2
- instruction type that can be scheduled per cycle. 3